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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,846	12/07/2005	Helmut Bechtel	DE 020159	1258

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EXAMINER	
HINES, ANNE M	

ART UNIT	PAPER NUMBER
2879	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/518,846	BECHTEL ET AL.	
	Examiner	Art Unit	
	ANNE M. HINES	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 February 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,4,6-8 and 11-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,4,6-8 and 11-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 December 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 2, 2009 has been entered.

Claims 1, 2-4, 6-8, and 11-20 are pending in the instant application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3-4, 6-8, 11-15, and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tokito et al. (US 6406801) in view of Weaver (US 6888305) and Austin (US 5337191).

Regarding claims 1, 3, and 19, Tokito teaches an electroluminescent device comprising a substrate (Fig. 11, 'substrate'), a laminated body composed of an anode (Fig. 11, 'ITO electrode'), an electroluminescent layer directly on the anode (Fig. 11, 'organic layer'; Column 11, lines 51-59), a cathode electrode directly on the

electroluminescent layer (Fig. 11, 'MgAg Mirror Electrode'), and 2n+1 transparent layers, where n = 0, 1, 2, 3, ... a, which transparent dielectric layers alternately have a high refractive index of n > 1.7 and are made TiO_2 (Fig. 11, 'multilayered film mirror'—see TiO_2 layers) and a low refractive index of n ≤ 1.7 and are made of SiO_2 (Fig. 11, 'multilayered film mirror'—see SiO_2 layers), and the transparent dielectric layer bordering on the anode has a high refractive index (Fig. 11, see TiO_2 layer directly adjacent to 'ITO electrode'). Tokito fails to teach wherein the anode is adjacent to the substrate and the 2n+1 transparent dielectric layers are adjacent to the cathode and on the opposite side of the cathode from the substrate and wherein the high refractive index material is ZnS or SnO_2 and the low refractive index material is MgF_2. Tokito also fails to explicitly disclose the characteristics of its invention with respect to transmission in the blue spectral region or daylight contrast.

In the same field of endeavor, Weaver teaches an electroluminescent device including a quarter-wave filter of alternating dielectric layers with alternating refractive indices (Column 2, lines 25-51), like Tokito, and further wherein the quarter-wave filter is provided either between the anode and the substrate (structure of Tokito) (Fig. 2, 110 & 120 & 142; Column 4, lines 7-16; Column 4, lines 49-50) or directly on the cathode, and on an opposite side of the cathode from the substrate, with the anode directly on the substrate (Fig. 3, 210 & 242 & 220; Column 5, lines 48-61), thus exemplifying recognized equivalent structures of the organic electroluminescent device with quarter-wave filter in the art.

In the same field of endeavor of materials for optical filters, Austin teaches wherein a quarter-wave filter with high and low index materials may have either TiO_2, like Tokito, or SnO_2 as the high index material, and either SiO_2, like Tokito, or MgF_2 as the low index material (Column 8, lines 17-28), thus exemplifying recognized equivalent materials of optical filters using alternating layers of high and low refractive index materials.

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the quarter-wave filter of Tokito directly on the second electrode, on an opposite side of the second electrode from the substrate, instead of between the anode and the substrate and to therefore have the anode directly adjacent to the substrate, and to have the high and low refractive index materials be SnO_2 and MgF_2, respectively, since the selection of any of these known equivalents would be considered within the level of ordinary skill in the art as evidenced by Weaver's and Austin's teachings.

Furthermore, Tokito, Weaver, and Austin disclose a device with a filter comprised of 2n + 1 dielectric layers formed of the claimed materials and positioned with relation to the device as required by claim 1. Additionally, Applicant discloses (e.g. in the Specification at Page 5, beginning at line 14) that a transparent dielectric layer adjoining an electrode causes transmission of light emitted by the device EL layer to be increased while the transmission in the blue spectral region is reduced, which filtering effect enables the daylight contrast to be increased; as such the Examiner considers the invention of Tokito, Weaver, and Austin, and specifically the function of the 2n +1

dielectric filter layers, to characteristically meet the requirement of claim 1 that the 2n +1 dielectric layers are configured to reduce transmission in a blue spectral region so that daylight contrast is increased.

Regarding claims 4, 6, and 20, Tokito teaches an electroluminescent device comprising a substrate (Fig. 11, 'substrate'), a first electrode (Fig. 11, 'ITO electrode'), an electroluminescent layer formed on the first electrode (Fig. 11, 'organic layer'; Column 11, lines 51-59), a second electrode (Fig. 11, 'MgAg Mirror Electrode'), and 2n+1 transparent layers, where n = 0, 1, 2, 3, ... a, which transparent dielectric layers alternately have a high refractive index of $n > 1.7$ and are made TiO_2 (Fig. 11, 'multilayered film mirror'—see TiO_2 layers) and a low refractive index of $n \leq 1.7$ and are made of SiO_2 (Fig. 11, 'multilayered film mirror'—see SiO_2 layers), and the transparent dielectric layer bordering on the first electrode has a high refractive index (Fig. 11, see TiO_2 layer directly adjacent to 'ITO electrode'). Tokito fails to teach the quarter-wave filter is formed on the second electrode and on an opposite side of the electroluminescent device from the substrate and wherein the high refractive index material is ZnS or SnO_2 and the low refractive index material is MgF_2. Tokito also fails to explicitly disclose the characteristics of its invention with respect to transmission in the blue spectral region or daylight contrast.

In the same field of endeavor, Weaver teaches an electroluminescent device including a quarter-wave filter of alternating dielectric layers with alternating refractive indices (Column 2, lines 25-51), like Tokito, and further wherein the quarter-wave filter is

provided either between the first electrode and the substrate (structure of Tokito) (Fig. 2, 110 & 120 & 142; Column 4, lines 7-16; Column 4, lines 49-50) or on the second electrode and on an opposite side of the electroluminescent device from the substrate (Fig. 3, 210 & 242 & 220; Column 5, lines 48-61), thus exemplifying recognized equivalent structures of the organic electroluminescent device with quarter-wave filter in the art.

In the same field of endeavor of materials for optical filters, Austin teaches wherein a quarter-wave filter with high and low index materials may have either TiO_2, like Tokito, or SnO_2 as the high index material, and either SiO_2, like Tokito, or MgF_2 as the low index material (Column 8, lines 17-28), thus exemplifying recognized equivalent materials of optical filters using alternating layers of high and low refractive index materials.

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the quarter-wave filter of Tokito on the second electrode instead of between the first electrode and substrate, and to have the high and low refractive index materials be ZnS and MgF_2, respectively, since the selection of any of these known equivalents would be considered within the level of ordinary skill in the art as evidenced by Weaver's and Austin's teachings.

Furthermore, Tokito, Weaver, and Austin disclose a device with a filter comprised of 2n + 1 dielectric layers formed of the claimed materials and positioned with relation to the device as required by claim 4. Additionally, Applicant discloses (e.g. in the Specification at Page 5, beginning at line 14) that a transparent dielectric layer adjoining

an electrode causes transmission of light emitted by the device EL layer to be increased while the transmission in the blue spectral region is reduced, which filtering effect enables the daylight contrast to be increased; as such the Examiner considers the invention of Tokito, Weaver, and Austin, and specifically the function of the 2n +1 dielectric filter layers, to characteristically meet the requirement of claim 4 that the 2n +1 dielectric layers are configured to reduce transmission in a blue spectral region so that daylight contrast is increased.

Regarding claim 7, Weaver further teaches wherein the first transparent dielectric layer is configured to reduce reflection of light generated by the electroluminescent layer at the second electrode so that more light passes through the second electrode (Column 3, lines 3-12; Column 4, lines 53-56; Column 5, line 52). Motivation to combine is the same as for claim 4.

Regarding claim 8, Weaver further teaches wherein the quarter-wave filter is configured to increase transmission of light generated in the electroluminescent layer through the second electrode (Column 3, lines 3-12). Motivation to combine is the same as for claim 4.

Regarding claim 11, Weaver further teaches wherein the quarter-wave filter is configured to vary color of light emitted from the electroluminescent device (Column 3, lines 3-12). Motivation to combine is the same as for claim 4.

Regarding claim 12, Weaver further teaches wherein the quarter-wave filter is configured to form a color filter (Column 3, lines 3-12). Motivation to combine is the same as for claim 4.

Regarding claim 13, Weaver further teaches wherein the OLED device and filter structure are used as a computer monitor or a television (Column 1, lines 13-23) and wherein the quarter-wave filter is tuned to transmit light at a peak wavelength within the range of wavelengths emitted by the OLED (Column 3, lines 3-12). One of ordinary skill in the art would reasonably contemplate that, since televisions are composed of an array of red, green, and blue pixels, the quarter-wave filter of Weaver would be tuned individually for the red, green, or blue pixels within the array of the television display device, in order to provide a television display that has an optimum chromaticity for each of the red, green, and blue pixels of the display.

Therefore, it would have been obvious to have the quarter-wave filter configured to generate light having transmission peaks that lie in wavelength ranges of the red, green, and blue colors in order to provide a television display that has an optimum chromaticity for each of the red, green, and blue pixels of the display. Motivation to combine with Tokito is the same as for claim 4.

Regarding claim 14, Weaver teaches wherein the quarter-wave filter is tuned to transmit light at a peak wavelength within the range of wavelengths emitted by the OLED (Column 3, lines 3-12). Since Weaver discloses tuning the filter to transmit a single peak wavelength from the range of wavelengths emitted by the electroluminescent device, the Examiner considers this to meet the requirement that a

width of the transmission peak of light emitted from the electroluminescent device is reduced since tuning a filter to transmit a peak wavelength will lessen the transmission of the other wavelengths in the range emitted by the device, thereby reducing the width of the peak transmitted as compared to the originally emitted.

Regarding claim 15, Weaver further teaches wherein the OLED device and filter structure are used as a computer monitor or a television (Column 1, lines 13-23). One of ordinary skill in the art would reasonably contemplate that, since televisions are composed of an array of red, green, and blue pixels that the electroluminescent layer of the display is divided into a plurality of color pixels in order to provide the required array pixels for the television or computer monitor displays. Therefore, it would have been obvious to one of ordinary skill in the art to have the electroluminescent layer of the display divided into a plurality of color pixels in order to provide the required array pixels for the television or computer monitor displays.

Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tokito et al. (US 6406801), Weaver (US 6888305), and Austin (US 5337191) and further in view of Morii (US 2001/0044035) and Yamazaki (US 2001/0017517).

Regarding claims 16 and 17, Tokito, Weaver, and Austin teach the invention of claim 4, but fail to teach wherein the transparent cathode (second electrode) which borders the electroluminescent layer comprises a first layer and a second layer formed over the first layer where the first layer includes barium and the second layer includes copper.

In the same field of endeavor of transparent cathode electrodes adjacent to the electroluminescent layer of an OLED device, Morii teaches a two layer cathode with a first layer and a second layer formed over the first layer where the first layer includes calcium and the second layer includes aluminum, silver or gold in order to provide a transparent cathode with an appropriate work function (Pages 2-3, Paragraph [0034]).

In the same field of endeavor of two layer cathodes for organic EL devices, Yamazaki teaches wherein a two layer cathode may have a first and second layer that includes calcium and silver as the first and second layers, respectively, or wherein the first and second layers are barium and copper (Page 8, Paragraph [0133]), respectively, thus exemplifying recognized equivalent materials of two layer cathode structures for organic EL devices.

Therefore, it would have been obvious to one of ordinary skill in the art to modify the invention of Tokito, Weaver, and Austin to have a two layer cathode of barium and copper in order to provide a transparent cathode with an appropriate work function, as disclosed by Morii and Yamazaki.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tokito et al. (US 6406801), Weaver (US 6888305), and Austin (US 5337191) and further in view of Campos (US 6278237).

Regarding claim 18, Tokito, Weaver, and Austin teach the invention of claim 4, and Tokito teaches wherein the substrate is glass (Page 3, Paragraph [0044]), but fail to teach wherein a single isolating film is between the substrate and the first electrode.

In the same field of endeavor of organic EL devices with glass substrates, Campos teaches wherein a single insulating film is between the glass substrate and the device electrodes in order to insulate the electrodes from the glass substrate (Fig. 2, 102; Column 5, lines 59-66).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the invention of Tokito, Weaver, and Austin to have a single isolating film is between the substrate and the first electrode in order to insulate the electrodes from the glass substrate, as disclosed by Campos.

Response to Arguments

Applicant's arguments filed February 2, 2009 have been fully considered but they are not persuasive.

Specifically, the Examiner finds unpersuasive Applicant's argument that the combination of references Tokito, Weaver, and Austin in the rejection of claims 9 and 10 in the Office Action of December 9, 2008 does not disclose the required subject matter of claims 9 and 10. Specifically, Applicant argues that the references do not disclose the 2n + 1 dielectric layers being configured to reduce transmission in blue spectral region so that daylight contrast is increased. The Examiner respectfully disagrees. Tokito, Weaver, and Austin disclose a device with a filter comprised of 2n + 1 dielectric layers formed of Applicant's claimed materials and positioned with relation to the device as required by Applicant's claims. Additionally, Applicant discloses e.g. in the Specification at Page 5, beginning at line 14 that a transparent dielectric layer adjoining an electrode

causes transmission of light emitted by the device EL layer to be increased while the transmission in the blue spectral region is reduced, which filtering effect enables the daylight contrast to be increased; as such the Examiner considers the function of the 2n +1 dielectric filter layers to characteristically disclose the function claimed in claims 1 and 4.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anne M. Hines whose telephone number is (571) 272-2285. The examiner can normally be reached on Monday through Friday from 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Anne M Hines/
Patent Examiner
Art Unit 2879

/NIMESHKUMAR D. PATEL/
Supervisory Patent Examiner, Art Unit 2879